

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Second Nicolson Creek

Waterbody Segment at a Glance:

County: Barton
Nearby Cities: Liberal, Burgess
Length of impairment: 3 miles
Pollutant: Sulfate
Source: Abandoned and reclaimed coal mined lands



TMDL Priority Ranking: Low

Description of the Problem

Beneficial uses of Second Nicolson Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life and Human Health associated with Fish Consumption

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

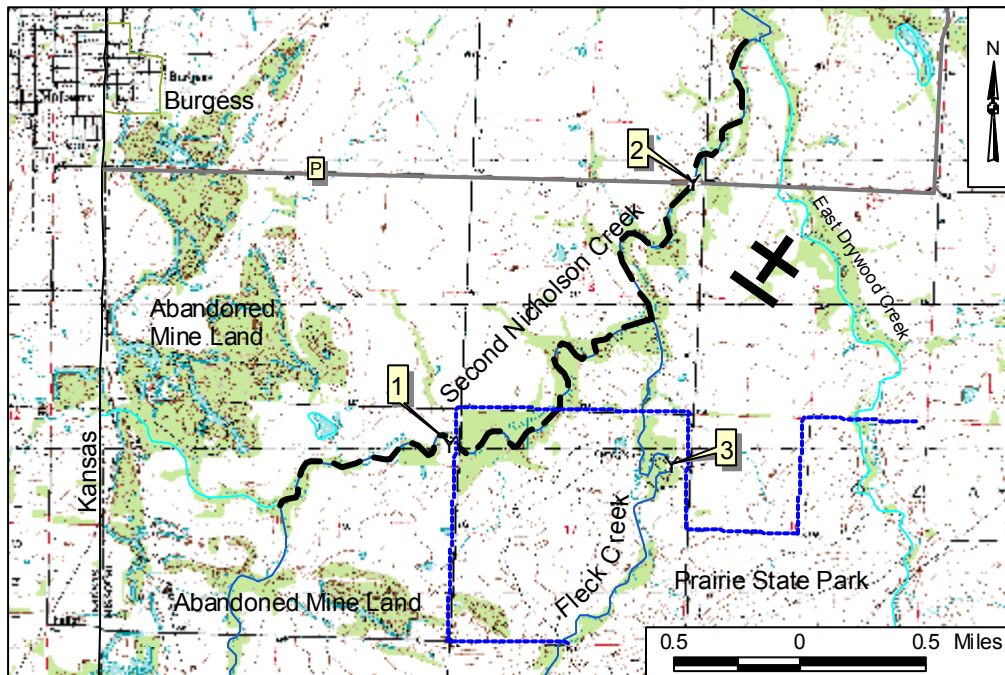
- Sulfate and chloride are linked together in Missouri's Water Quality Standards, 10 CSR20-7.031 (4)(L)1. There it states that the concentration of chloride plus sulfate shall not exceed 1000 milligrams per liter (mg/L) for protection of aquatic life.

Sulfide minerals, commonly found in coal and the surrounding rock, oxidize when exposed to the air and are subsequently dissolved by groundwater. In many old coal mining areas, this weathering process results in large amounts of sulfate dissolved in groundwater and in surface waters draining these mined lands. Freshwater aquatic life cannot tolerate large amounts of dissolved substances in water. The Missouri water quality standard for dissolved substances is 1000 mg/L of sulfate plus chloride. Levels of chloride in Missouri streams is typically much less than 100 mg/L, so most dissolved substance problems are related to high levels of sulfate.

Second Nicolson Creek was placed on the 303(d) list due to some high conductivity measurements. Conductivity significantly correlates with sulfate and chloride levels in streams. Recent data for sulfate and chloride on this stream suggests sulfate and chloride levels are in conformance with state standards, but the data set is considered too small to safely make this assumption. The Department of

Natural Resources will continue to monitor sulfate and chloride levels in this stream to clarify its 303(d) status. A map of the area and table summarizing the existing data follows.

Second Nicolson Creek in Barton County, Missouri, Showing Sampling Sites



— — — — — Impaired Section → Direction of Flow

Sample Site Index

- 1 – Second Nicolson Creek at Northwest corner of Prairie State Park
- 2 – Second Nicolson Creek at Highway P
- 3 – Fleck Creek at Prairie State Park Picnic Area

Sulfate Concentrations in Second Nicolson Creek and Tributary, 1997-1999

Site #	Date	Sulfate (mg/L)	Chloride (mg/L)
1	6/3/99	646	7
1	8/11/99	915	9
2	7/2/97	448	6
2	7/30/97	758	2.5
2	9/3/97	1080	
3	7/2/97	366	0.99
3	7/30/97	742	2.5

Source: Missouri Department of Natural Resources

For more information call or write:

Missouri Department of Natural Resources

Water Protection Program

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